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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/809,883	03/16/2001	Richard W. Siegel	0094.048	7162

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EXAMINER

MEEKS, TIMOTHY HOWARD

ART UNIT	PAPER NUMBER
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1762

10

DATE MAILED: 09/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/809,883

Applicant(s)

SIEGEL ET AL.

Examiner

Timothy H. Meeks

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 7/11/03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-4,6-11 and 13-42 is/are pending in the application.
- 4a) Of the above claim(s) 24-42 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4,6-11 and 13-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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## **DETAILED ACTION**

### ***Application Status***

The amendment filed on 11 July 2003 in response to the Office Action mailed on 09 January 2003 has been fully considered.

In the amendment, claims 1, 2, 18-20, 22, and 23 have been amended and claim 5 and 12 have been canceled. Claims 24-42 remain withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention. Claims 1-4, 6-11, and 13-23 are under consideration.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 21-23 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 499004 (EP '004).

The claimed process is explicitly disclosed at page 3, line 45 to page 5, line 20 of EP '004.

Claims 1-4, 7, 8, 10, 11, 21, and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Van Bilsen et al. (6,121,061).

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The claimed process is disclosed at figure 4, col. 4, line 56, col. 11, lines 17-38, and col. 17, lines 5-15. In the disclosed process, the substrate is heated to a silicon epitaxial deposition temperature of 1120 °C in accordance with ramp 95 which appears to last about 30 seconds and cooled after deposition in accordance with ramp 97 which appears to last about 20-30 seconds. With respect to claim 4, at least some deposition gas would be expected to be in contact with the substrate through adsorption on the substrate surface, etc., at the end of the 50 second deposition period when the cooling ramp begins.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 7-11, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP '004 in view of Streckert et al. (5,350,545).

As pointed out by applicants in Paper 9, EP '004 fails to explicitly disclose resistive heating of the substrate. EP '004 exemplifies a radiant heating system to form the required thermal gradient. However, because EP '004 does not explicitly require the exemplified radiant heating method and does not appear to place criticality thereto but rather that the bottom to top thermal gradient be achieved, and because Streckert et al. disclose that both radiant heating and resistive heating are both effective methods for forming a thermal gradient in a CVI process (col.

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7, lines 10-50, particularly lines 44-45), it would have been obvious to have resistively heated the bottom of the substrate because doing so would have been expected to be an effective alternative for forming the desired thermal gradient disclosed in EP '004.

Claims 6 and 14-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP '004 in view of Streckert et al. (5,350,545) as applied above, and further in view of Arenz et al. (4,863,798).

EP '004, although teaching carbon substrates, does not explicitly disclose graphite substrate and EP '004 does not explicitly disclose use of methane and helium or the claimed ratios thereof.

However, because Arenz discloses that depositing a pyrolytic coating on a graphite substrate to make a fiber reinforced composite by chemical infiltration of methane and helium gas into the substrate structure provides facilitates good load transfer between fibers in the substrate, and strengthens and stabilizes the substrate structure (abstract, col. 2, lines 60-63, col. 3, lines 39-55, and col. 5, line 60 to col. 6, line 40), it would have been obvious to provide methane and helium as the precursor gases in the CVI process of EP '004 to graphite substrate so as to achieve the pyrolytic carbon coating along with the benefits therefrom described by Arenz. The ratio of methane to neutral (helium) gas at col. 6, lines 19-25 falls in the claimed range.

Claims 9 and 14-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Bilsen in view of Scholz et al. (5,471,946).

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Bilsen does not disclose the temperature range of claim 9, use of carrier gas such as helium, or use of methane and helium gases.

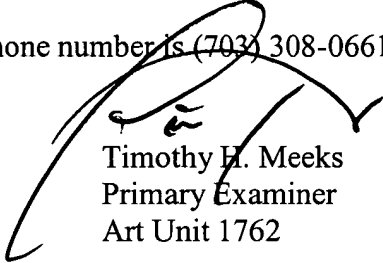
However, because the process of Van Bilsen is related to CVD deposition in general and because Scholz discloses that deposition of epitaxial silicon carbide is on semiconductor substrates is conducted at temperatures of about 1300 to 1400 °C using gas mixtures comprising helium, silane and methane (col. 2, line 65 to col. 3, line 30), it would have been obvious to provide these gases in the Van Bilsen process so as to provide epitaxial silicon carbide coatings by CVD. With respect to claims 18-20, the prior art is silent as to the ratio of methane to helium, however, it is well established that "Where the principal difference between the claimed process and that taught by the reference is a temperature difference, it is incumbent upon applicant to establish criticality of that difference" See *Ex parte Khusid*, 174 USPQ 59. This decision is clearly analogous to differences in other process parameters such as ratio of reactants or reactants and diluents. If applicant can establish a showing of criticality in the claimed ratios, the rejection will be withdrawn with respect to claims 18-20.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy H. Meeks whose telephone number is (703) 308-3816. The examiner can normally be reached on Mon., Tues., Thurs.(6-6:30), Fri.(6:30-10:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P. Beck can be reached on (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Timothy H. Meeks  
Primary Examiner  
Art Unit 1762

nf2  
September 15, 2003